

WHAT IS CLAIMED IS:

1. A semiconductor module, comprising:
a wiring substrate on which wiring is formed;
a semiconductor device electrically connected to the wiring formed on said wiring substrate; and
an external connection terminal arranged on the semiconductor device mounted side of said wiring substrate so as to be a connected portion between said wiring and the outside electrically connected the wiring,

wherein there is formed an insulating resin layer thicker than said semiconductor device between said wiring substrate and said external connection terminal.

2. A semiconductor module, comprising:
a wiring substrate on which wiring is formed;
a semiconductor device electrically connected to the wiring formed on said wiring substrate; and
an insulating resin layer formed on the semiconductor device mounted side of said wiring substrate and having an inclined portion at a given inclination to the mounting surface and a flat portion which is almost flat and provided for an arrangement of the external connection terminal to be an externally connected portion,

wherein a part of the wiring is formed on the inclined portion of said insulating resin layer for an electrical connection between said wiring and said

3. A semiconductor module according to claim 1 or claim 2, wherein said insulating resin layer is formed by mask printing.

an external connection terminal to be a connected portion between the wiring and the outside electrically connected to said wiring on said insulating resin layer.

5. A semiconductor module according to claim 1 or claim 2, wherein said insulating resin layer has a shape of almost enclosing said semiconductor device.

6. A semiconductor module according to claim 5,
wherein said insulating resin layer is frame-shaped.

7. A semiconductor module according to claim 5, wherein an inclination of an inner circumferential side is gentler than that of an outer circumferential side of said insulating resin layer.

8. A semiconductor module according to claim 1, wherein a plurality of insulating resin layers are used instead of said insulating resin layer and arranged as if they enclose said semiconductor device.

9. A semiconductor module according to claim 1, wherein said wiring substrate is a silicon substrate or a glass substrate.

10. A semiconductor module according to claim 1, wherein said insulating resin layer may be made of an insulating material having an elastic modulus of approx. 0.1Gpa to approx. 10Gpa.

11. A semiconductor module according to claim 1, wherein a film thickness of said insulating resin layer is approx. 10 μ m to approx. 350 μ m.

12. A semiconductor module according to claim 1, wherein said semiconductor device may be one of a semiconductor chip, a chip scale package (CSP), a ball grid array (BGA), and an wafer-level CSP.

13. A semiconductor module according to claim 1, wherein a sum of a thickness of said insulating resin layer and a height of said external connection terminal is greater than a distance from the mounted surface of said semiconductor device to a rear surface thereof.

14. A semiconductor module according to claim 1, wherein a sum of a thickness of said insulating resin layer and a height of said external connection terminal is almost equal to a distance from the mounted surface of said semiconductor device to the rear surface thereof.

15. A semiconductor module, comprising:
a wiring substrate on which wiring is formed;
a semiconductor device electrically connected

to the wiring formed on said wiring substrate through bumps; and

an external connection terminal to be a connected portion between the wiring and the outside electrically connected to said wiring,

wherein the semiconductor device is mounted on the wiring substrate without using an underfill; and

wherein the semiconductor device comprises a semiconductor chip and the wiring substrate comprises a silicon substrate.

16. A semiconductor module, comprising:
a wiring substrate on which wiring is formed;
a semiconductor device electrically connected to the wiring formed on said wiring substrate through bumps; and

an external connection terminal to be a connected portion between the wiring and the outside electrically connected to said wiring,

wherein the semiconductor device is mounted on said wiring substrate without using an underfill; and

wherein an insulating resin layer is formed between the semiconductor chip of said semiconductor device and the bumps.

17. A semiconductor module, comprising:
a wiring substrate on which wiring is formed;
a semiconductor device electrically connected to the wiring formed on said wiring substrate through

2025 RELEASE UNDER E.O. 14176

bumps; and

an external connection terminal to be a connected portion between the wiring and the outside electrically connected to said wiring,

wherein the semiconductor device is mounted on said wiring substrate without using an underfill; and

wherein an insulating resin layer is formed between the wiring connected to the bumps of said semiconductor device and said wiring substrate.

18. A semiconductor module according to claim 16, wherein said insulating resin layer is made of an insulating material having an elastic modulus of approx. 0.1Gpa to approx. 10Gpa.

19. A semiconductor module according to claim 16, wherein a film thickness of said insulating resin layer is approx. 10 μ m to approx. 350 μ m.

20. A semiconductor module according to claim 16, wherein said insulating resin layer is formed by mask printing.

21. A semiconductor module according to claim 16, wherein said external connection terminal is formed on a second insulating resin layer, which is formed on said semiconductor device mounted side of said wiring substrate, having an inclined portion at a given inclination to the mounting surface and an almost plane flat portion on which said external connection terminal is arranged.

22. A mounting structure, comprising:
a wiring substrate on which wiring is formed;
a semiconductor device electrically connected
to the wiring formed on said wiring substrate through
bumps; and

encapsulant for filling a gap between said
wiring substrate and said semiconductor device,
wherein the encapsulant comprises a material
not including a filler.

23. A mounting structure, wherein a heat conduc-
tive material layer is formed on an external substrate
on which the semiconductor module according to claim 1
is mounted and a semiconductor device of said semicon-
ductor module is connected to the heat conductive
material layer.

24. A semiconductor module according to claim 1,
further comprising a metal member connecting said
semiconductor device to said circuit board.

25. A semiconductor module according to claim 1,
wherein said semiconductor device is connected to said
wiring substrate by die-attaching and said semicon-
ductor device is electrically connected to the wiring
formed on said wiring substrate by wire bonding.

26. A semiconductor module, comprises:
a wire substrate on which wiring is formed;
a semiconductor device electrically connected
to the wiring formed on said wiring substrate;
an insulating material covering said semicon-

ductor device; and

an external connection electrode to be a connected portion between wiring formed on said insulating material and an outside.

27. A semiconductor module according to claim 26, wherein there is provided an intermediate plate in the insulating material between said semiconductor device and said external connection terminal.

28. A semiconductor module, comprising: a substrate, a first insulating layer formed in a first area of said substrate, a semiconductor chip mounted in a second area of said substrate, an external connection terminal formed on said first insulating layer, and a wire for electrically connecting electrodes of said semiconductor chip to said external connection terminal,

wherein said first insulating layer relaxes a stress generated between said semiconductor module and another substrate on which said semiconductor module is mounted and is formed by using a mold.

29. A semiconductor module according to claim 28, wherein said first insulating layer is formed in a circumferential portion of said substrate.

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